

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Paul N. Stoving et al. Art Unit : 2832
Serial No. : 10/802,409 Examiner : Marina Fishman
Filed : March 16, 2004 Conf. No. : 3843
Title : VACUUM ENCAPSULATION HAVING AN EMPTY CHAMBER

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

(1) Real Party in Interest

McGraw-Edison Company, the assignee of this application, is the real party in interest.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

Claims 1-5, 8, 18, 22, and 24-28 are pending in the application, with claims 1 and 18 being independent. Claims 6, 7, 9-17, 19-21, and 23 have been cancelled. Claims 1-5, 8, 27, and 28 have been allowed. Claims 18 and 24-26 are rejected. Appellant is appealing the rejection of claims 18 and 24-26.

(4) Status of Amendments

The amendment to claims 24 and 25 made in response to the Final Office Action of November 14, 2006 has been entered pursuant to the Notice of Panel Decision from Pre-Appeal Brief Review of March 30, 2007. Claim 21 was cancelled in response to the Final Office Action of April 25, 2006.

(5) Summary of Claimed Subject Matter

In the discussion below, reference numerals and references to particular portions of the specification are inserted for illustrative purposes only and are not meant to limit the scope of the claims.

Independent claim 18 is directed to a vacuum switching device that includes a vacuum interrupter and a hollow housing adjacent to the vacuum interrupter. See, e.g., the application at Fig. 1, elements 102 and 118; Fig. 4, elements 102 and 118; and page 5, lines 5-6. A seal is provided around the vacuum interrupter and the hollow housing, where the seal defines an air-filled cavity within the hollow housing. See, e.g., the application at Figs. 1 and 2, elements 118, 122, 124, and 126; page 5, lines 14-16; and page 6, lines 5-7. A tube including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and the cavity is provided through the seal. See, e.g., application at Fig. 2, element 202; page 6, lines 20-25; and page 9, lines 1-4.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 18 and 26¹ have been rejected as being anticipated by U.S. Patent No. 3,849,617 (Pflanz). Claims 24 and 25 have been rejected as being obvious over Pflanz in view of U.S. Patent No. 4,168,414 (Kumbera).

(7) Argument

Appellant requests reversal of the rejection under section 102 because Pflanz fails to describe or suggest a tube provided through the seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and the cavity, as recited in claim 18.

Claims 18 and 26 have been rejected under 35 U.S.C. § 102 as being anticipated by Pflanz. Appellant requests reversal of this rejection because Pflanz does not describe or suggest at least a tube provided through a seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in claim 18. The Examiner points to Pflanz' tube 24 to show a tube provided through a seal. See Final Office Action of Nov. 14, 2006 at page 3, lines 6-9. However, Pflanz does not disclose that the tube 24 includes cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in claim 18. Rather, Pflanz merely discloses that the tube 24 is used to remove air from a space 23 within a vacuum interrupter 10 "to the extent desired" and

¹ Claim 21 has been canceled, and is not listed in the recitation of rejected claims.

then the tube 24 is subsequently sealed. See Pflanz at col. 2, lines 40-66 and Fig. 1. As is evident from this description and from the design in Fig. 1 of Pflanz, the tube 24 does not include cured liquefied encapsulation material to block air between the space 23 and an exterior of the interrupter 10.

Referring to the tube 24, the Examiner asserts that “the tube is sealed by brazing material that works as an encapsulation material.” See final Office Action of Nov. 14, 2006 at page 5, lines 6-7. Appellant respectfully disagrees. Pflanz merely indicates that the tube 24 is positioned in an opening formed in the wall member 14, and that the tube 24 “is brazed therein.” See Pflanz at col. 2, lines 61-64. Thus, the tube 24 is first placed into the opening in the wall member 14, then it is secured within the opening in the wall member 14 by being brazed into the opening. Thus, the brazing mentioned in Pflanz is to secure the tube 24 into an opening in the wall member 14; it is not to seal the tube 24 or to provide a cured liquefied encapsulation material in the tube 24. There is no indication that the tube is sealed with this brazing material, or any material other than the tube itself, much less that the tube 24 includes a material that is a cured liquefied encapsulation material. Rather, Pflanz merely indicates that “[w]ith the space 23 evacuated to the extent desired, the tubation 24 is sealed.” See Pflanz at col. 2, lines 64-65. Pflanz does not describe or suggest what provides for the sealing of the tube 24. Moreover, as is shown in Fig. 1 of Pflanz, the tube 24 is void of an encapsulation material. Thus, for these reasons, Pflanz does not describe or suggest at least a tube provided through a seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in claim 18.

Claim 26 depends from claim 18 and is allowable for at least the reasons that claim 18 is allowable.

For at least these reasons, the rejection under section 102 should be reversed.

Appellant requests reversal of the rejection under section 103 because Pflanz and Kumbera, either alone or in combination, fail to describe or suggest at least a tube provided through a seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in claim 18, and a second end of the tube is open to a second encapsulation material provided around the vacuum interrupter, the hollow housing, and the seal, as recited by claim 24.

Claims 24 and 25, which depend directly or indirectly from claim 18, have been rejected under 35 U.S.C. § 103(a) as being obvious over Pflanz in view of Kumbera. Appellant requests reversal of this rejection because any permissible combination of Pflanz and Kumbera would still fail to describe or suggest a tube provided through a seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in independent claim 18. In Kumbera, a guide tube 47 is secured in telescoped relation to the outer end of the contact housing 42, and the guide tube 47 projects outwardly concentrically of an operating rod 40 and an encapsulating, insulating housing 23. See Kumbera at col. 7, lines 11-14. The guide tube 47 acts as a passageway for the operating rod 40. See Kumbera at col. 7, lines 16-19. However, as in Pflanz, there is no indication that the guide tube 47 includes cured liquefied encapsulation material to block the passage of air between an exterior of the seal and a cavity, as recited in claim 18.

Thus, claim 18 is allowable over any proper combination of Pflanz and Kumbera, and claims 24 and 25 are allowable at least for their dependency on claim 18. In addition, Kumbera and Pflanz, alone or in combination, also fail to describe or suggest the second end of the tube is open to a second encapsulation material provided around the vacuum interrupter, the hollow housing, and the seal, as recited in claim 24.

As the Examiner concedes, Pflanz does not describe or suggest "an encapsulation material provided around the vacuum interrupter, the hollow housing and the seal." See final Office action of Nov. 14, 2006 at page 4, lines 2-3. For this feature, the Examiner points to element 23 shown in Figure 3 of Kumbera. Figure 3 of Kumbera shows an interrupter unit 3 that includes a vacuum enclosure 19 with contact end connector cap units 20 and 21, which are cast and encapsulated within an solid insulation wall 23 to form an integrated self-supporting structure. See Kumbera at col. 5, lines 58-63 and Fig. 3. Kumbera also shows a guide tube 47 that is disposed in the wall 23. See Kumbera at col. 7, lines 11-14 and Fig. 3. The wall 23 is

formed to have a planar surface 52 that is attached to a side wall 52 of a submersible housing 54. See Kumbera at col. 8, lines 4-10. The housing 54 includes an opening 55 through which the guide tube 47 extends. See Kumbera at col. 8, lines 11-13.

Thus, one end of the guide tube 47 opens beyond the wall 23. Even if the wall 23 is assumed to be an encapsulation material provided around the vacuum interrupter, the hollow housing, and the seal, neither end of the guide tube 47 opens to the wall 23. As such, Kumbera also fails to describe or suggest a second end of the tube is open to a second encapsulation material provided around the vacuum interrupter, the hollow housing, and the seal, as recited in claim 24.

Claim 25 depends from dependent claim 24 and is believed to be allowable over Pflanz and Kumbera for at least the reasons discussed above with respect to claims 18 and 24.

For at least these reasons, the rejection under section 103 should be reversed.

The appeal brief fee of \$500 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of deposit account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Appendix of Claims

1. (Previously presented) A vacuum switching device comprising:
a vacuum interrupter;
a current exchange housing adjacent to the vacuum interrupter;
a seal provided around the vacuum interrupter and the current exchange housing so as to define a cavity within the current exchange housing and adjacent to the vacuum interrupter; and
a capillary tube provided through the seal, the capillary tube disposed such that a first end of the capillary tube accesses the cavity and a second end of the capillary tube accesses an exterior of the seal.
2. (Previously presented) The vacuum switching device of claim 1 wherein the capillary tube comprises a syringe needle inserted through the seal.
3. (Previously presented) The vacuum switching device of claim 1 wherein the capillary tube is integrally formed into the seal during formation of the seal.
4. (Previously presented) The vacuum switching device of claim 1 wherein the second end of the capillary tube is open to an encapsulation material provided around the vacuum interrupter, the current exchange housing, and the seal.
5. (Original) The vacuum switching device of claim 4 wherein the encapsulation material includes a pre-filled, hot-curing, two-component epoxy resin.
- 6-7. (Canceled)
8. (Original) The vacuum switching device of claim 1 comprising an operating rod extending through the seal into the cavity, and operable to actuate the vacuum interrupter.
- 9-17. (Canceled)

18. (Previously presented) A vacuum switching device comprising:
a vacuum interrupter;
a hollow housing adjacent to the vacuum interrupter;
a seal provided around the vacuum interrupter and the hollow housing, the seal defining an air-filled cavity within the hollow housing; and
a tube provided through the seal and including cured liquefied encapsulation material to block the passage of air between an exterior of the seal and the cavity.

19-21. (Canceled)

22. (Previously presented) The vacuum switching device of claim 18 wherein the tube comprises a syringe needle inserted through the seal.

23. (Canceled)

24. (Previously Presented) The vacuum switching device of claim 18 wherein:
the tube is disposed such that a first end of the tube accesses the cavity and a second end of the tube access an exterior of the seal, and
the second end of the tube is open to a second encapsulation material provided around the vacuum interrupter, the hollow housing, and the seal.

25. (Previously Presented) The vacuum switching device of claim 24 wherein the second encapsulation material includes a pre-filled, hot-curing, two-component epoxy resin.

26. (Previously presented) The vacuum switching device of claim 18 comprising an operating rod extending through the seal into the cavity, and operable to actuate the vacuum interrupter.

27. (Previously presented) The vacuum switching device of claim 1 wherein the capillary tube has an inner diameter of approximately 0.25 to 0.35 mm.

28. (Previously presented) The vacuum switching device of claim 1 wherein the capillary tube has a gauge from 23 to 26.

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Evidence Appendix

None.

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Related Proceedings Appendix

None.